

11

was recorded beginning on the second day after conidia application and daily thereafter. Dead cockroaches were individually held in a humidity chamber for 10 days to identify sporulating fungi.

In the test with German cockroaches the fungal isolate *B. bassiana* SP111 (FIG. 6) caused 100% mortality after contact with spores. Sporulation of the fungus was evident on about 82% of the dead cockroaches.

EXAMPLE 10

Evaluation of *B. bassiana* Bait Formulations for Control of Fire Ants

Bait formulations with ground peanut material were offered to colonies of fire ant workers in plastic boxes ($\sim 20 \times 12 \times 10$ cm) containing a small dish of water and a plastic petri dish (60 mm diameter) to serve as a nest cell. Colonies were established 2-4 days before the start of the experiment to allow ants to adapt to their new environment. The formulations (0.5 g) were offered on weigh papers (1 square inch) or small dishes and left in the boxes for 34 days. Two controls were used: a clean control which received no formulation but only water, and a bait control which received the bait formulation without any fungus. Abbott-corrected mortality greater than 70% at 14 days after treatment was observed for the fungal isolate containing about 10% of the *B. bassiana* No. 447.

EXAMPLE 11

Chemical Baits from Traps Compared to Fungal Formulations for the Control of Fire Ants

The chemical baits which were compared are from: MAX ant trap, RAID ant trap, and COMBAT ant trap. The chemical baits were removed from the traps and offered to ants on paper. The control received the same formulation as the fungus treatment but without conidia. The fungal formulation contained peanut material and cornstarch and 10% conidia of *B. bassiana* No. 447. MAX and the fungal formulations had similar mortality, although MAX caused mortality to increase much more rapidly than the fungus as expected, since the fungus requires 34 days to infect and kill the insect. As shown in FIG. 7, COMBAT and RAID were less efficient than MAX and *Beauveria bassiana*.

EXAMPLE 12

Chemical Baits from Traps Compared to Fungal Formulation for the Control of Pharaoh Ants

The chemical baits which were compared are from: MAX ant trap, RAID ant trap, and COMBAT ant trap. The chemical baits were removed from the traps and offered to ants on paper. The control received the same formulation as the fungus treatment but without conidia. The fungal formulation contained peanut material and cornstarch and 10% conidia of *B. bassiana* No. 447. The results of this experiment is shown in FIG. 8.

EXAMPLE 13

Chemical Baits from Traps Compared to Fungal Formulations for the Control of Crazy Ants

The chemical baits which were compared are from: MAX ant trap, RAID ant trap, and COMBAT ant trap. The chemical baits were removed from traps and offered to ants on paper. The control received the same formulation as the

12

fungus treatment but without conidia. The fungal formulation contained peanut material and cornstarch and 10% conidia of *B. bassiana* No. 447. In all experiments, the bait with *Beauveria bassiana* caused mortality similar or greater than that caused by chemical baits. See FIG. 9 for the results of one such experiment.

EXAMPLE 14

10 Chemical Baits from Traps Compared to Fungal Formulation for Control of Carpenter Ants

The chemical baits which were compared are from: MAX ant trap, RAID ant trap, and COMBAT ant trap. The chemical baits were removed from traps and offered to ants on paper. The control received the same formulation as the fungus treatment but without conidia. The fungal formulation contained peanut material and cornstarch and 10% conidia of *B. bassiana* No. 447. As can be seen from FIG. 10, the fungal formulation has performance similar to, or slightly better than, MAX and RAID baits, and only slightly less than COMBAT. Both COMBAT and the fungus had their effects delayed in relation to RAID and MAX, but the delay in fungal effect is longer than that of COMBAT.

25 EXAMPLE 15

Field Pesticides Compared to Fungal Formulations for the Control of Fire Ants

30 AMDRO chemical baits were evaluated. The bait in one experiment also had 10% of an ACEPHATE fire ant powder insecticide. In each treatment, one-half gram of formulation was provided per arena on weighing paper. The formulation was removed after 4 days. The control received the same formulation as the fungus treatment but without conidia. The fungal formulation contained peanut material, cornstarch, and 10% conidia of *B. bassiana* No. 447.

35 ACEPHATE (which is not normally a bait formulation) kills the ants almost immediately. Mortality with AMDRO increases less rapidly, but by day 4, $\sim 80\%$ of the population was dead. Mortality with fungus increases at a slower rate but final mortality after 2-4 weeks is similar to that obtained with the chemical pesticides (FIG. 11).

40 It should be understood that the examples and embodiments described herein are for illustrative purposes only and that various modifications or changes in light thereof will be suggested to persons skilled in the art and are to be included within the spirit and purview of this application and the scope of the appended claims.

45 50 What is claimed is:

1. A composition for the control of a cockroach or ant pest comprising food source particles, a drying agent, and a biocontrol agent derived from an entomopathogenic fungi selected from the group consisting of spores and conidia and wherein said drying agent is a chemically acting drying agent, a physically acting drying agent, or combinations of more than one chemically acting and/or physically acting drying agent.

2. The composition, according to claim 1, wherein said 55 entomopathogenic fungi is selected from the group consisting of *Beauveria bassiana* No. 447, having all of the identifying characteristics of ATCC 20872, and *Beauveria bassiana* SP111, having all of the identifying characteristics of ATCC 74038.

3. The composition, according to claim 2, wherein said *Beauveria bassiana* is isolate No. 447, having all of the identifying characteristics of ATCC 20872.

4. The composition, according to claim 2, wherein said *Beauveria bassiana* is isolate SP111, having all of the identifying characteristics of ATCC 74038.

5. The composition, according to claim 1, wherein said drying agent is a chemically acting drying agent.

6. The composition according to claim 5, wherein said chemically acting drying agent is selected from the group consisting of calcium chloride, sodium sulfate, or magnesium perchlorate, phosphorus pentoxide, sicacide, metals, and metal hydrides.

7. The composition, according to claim 1, wherein said drying agent is a physically acting drying agent.

8. The composition according to claim 7, wherein said physically acting drying agent is selected from the group consisting of SiO_2 , synthetic zeolite, naturally occurring zeolite, aluminum oxide (alumina), drierite, calcium sulfate, calcium chloride, calcium oxide, sodium sulfate, copper (II) sulfate, potassium carbonate, and magnesium oxide and said chemically acting drying agent is selected from the group consisting of calcium chloride, sodium sulfate, or magnesium perchlorate, phosphorus pentoxide, sicacide, metals, and metal hydrides.

9. The composition of claim 1, further comprising a pheromone or extract.

10. The composition of claim 7, further comprising a pheromone or extract.

11. The composition of claim 5, further comprising a pheromone or extract.

12. The composition of claim 5, wherein said composition can pass through a 60 mesh, or smaller, sieve.

13. The composition of claim 7, wherein said composition can pass through a 60 mesh, or smaller, sieve.

14. The composition of claim 1, wherein said composition can pass through a 60 mesh, or smaller, sieve.

15. A method of controlling a cockroach or ant pest comprising applying to the environment of the cockroach or ant pest, or directly onto the cockroach or ant pest, a

composition comprising food source particles, a drying agent, and a biocontrol agent derived from an entomopathogenic fungi selected from the group consisting of spores and conidia and wherein said drying agent is a chemically acting drying agent, a physically acting drying agent, or combinations of more than one chemically acting and/or physically acting drying agent.

16. The method of claim 15, wherein said physically acting drying agent is selected from the group consisting of SiO_2 , synthetic zeolite, naturally occurring zeolite, aluminum oxide (alumina), drierite, calcium sulfate, calcium chloride, calcium oxide, sodium sulfate, copper (II) sulfate, potassium carbonate, and magnesium oxide and said chemically acting drying agent is selected from the group consisting of calcium chloride, sodium sulfate, or magnesium perchlorate, phosphorus pentoxide, sicacide, metals, and metal hydrides.

17. The method according to claim 15, wherein said entomopathogenic fungi is selected from the group consisting of *Beauveria bassiana* No. 447, having all of the identifying characteristics of ATCC 20872, and *Beauveria bassiana* SP111, having all of the identifying characteristics of ATCC 74038.

18. The method according to claim 15, wherein said composition further comprises a pheromone or extract.

19. The method according to claim 15, wherein said composition can pass through a 60 mesh, or smaller, sieve.

20. The method according to claim 16, wherein said composition can pass through a 60 mesh, or smaller, sieve, and, optionally, further comprises a pheromone or extract.

* * * * *